# Oregon Business Review

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## New Horizons Seen for Pacific Northwest Industry

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There are some clear indications that the future growth of industry in the Pacific Northwest must be sought in new directions of endeavor. Although the last two decades have brought increasing diversity in the region's industrial structure, it is still overwhelmingly dependent upon extractive rather than manufacturing activities. The region's traditional preoccupation with a raw-materials economy has served to obscure the need and opportunities for its participating in technological developments in other fields of industrial enterprise. Yet there are brilliant opportunities for new ventures within the field of electronics, nucleonics, plastics, light-metals fabrication, and chemical processing. As a matter of clear-cut observation, these segments of vital industry can be allied in many ways with the existing industries of the region to facilitate their stabilization and expand their possibilities.

The steady and rapid growth of population in the Pacific Northwest has been—and continues to be—nationally noted. The pleasant aspects of life in the region, the legend and fact of its opportunities, are an irresistible magnet for continued population movements to the area. Although population growth is self-generating to some extent in opportunities for livelihood, employment on all fronts must keep pace—or the expansion in population will shift to a purely transitory sort of thing. In some measure, this is already taking place—the Pacific Northwest is frequently but a point en route to California. Where can employment expansion take place? Is it probable that our traditional activities can absorb a growing labor force? To what extent can existing Northwest industry be diversified, expanded, and consolidated?

There is substantial agreement that the forest-products industries cannot be expected to provide a very large number of new jobs. Consolidation rather than expansion seems probable. The lumber industry has been one of the slowest moving of all industrial groups. The National Lumber Manufacturers Association has succinctly summarized the situation:[1] "The population of the United States increased 22% from 1928 to 1948, while the per capita lumber consumption dropped about 8%." The association also remarked that, although this trend has more recently reversed

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[1] *Let's Face It,* Products and Research Committee of the National Lumber Manufacturers Association, 1953.

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## Financial Experience of Oregon Unemployment Fund Surveyed

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The Oregon State Unemployment Compensation Commission has recently published a *Digest of the Financial Experience and Actuarial Requirements of the Oregon Unemployment Compensation Program.* In this article, some of the *Digest's* data will be presented in conjunction with information obtained from independent research.

Reference will frequently be made to the size of Oregon's Unemployment Compensation Fund. In reality, reference is being made to Oregon's portion of the Federal Unemployment Trust Fund, which is established in the Treasury of the United States. Contributions (principally payroll taxes) are received from Oregon's covered employers and initially deposited with the State Treasurer. This official transfers these funds to the U. S. Treasury.

The Federal Unemployment Trust Fund is primarily composed of deposits made by the state unemployment compensation commissions and the Railroad Retirement Board (for railroad unemployment insurance). The portion of the fund not required to meet current withdrawals is invested in interest-bearing obligations of the United States or in obligations guaranteed as to both principal and interest by the United States.

Special obligations of the United States may be issued exclusively to the fund. They bear an interest rate equal to the average rate borne by all interest-bearing obligations of the United States forming a part of the public debt at that particular time. Obligations other than these must provide an investment yield not less than that which would be required in case special obligations were issued. Interest is credited quarterly to each agency's account. The basis utilized is the average daily balance of the respective accounts.[1]

In order to meet current benefit obligations, the Oregon State Unemployment Compensation Commission requisitions money from the Federal Unemployment Trust Fund. The commission also maintains records on each covered employer's reserve account. The employer's reserve account is credited with his contributions and debited with benefits paid to his (or formerly his) unemployed workers.

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[1] *United States Code Annotated,* Titles 41-42, Sec. 1104, pp. 584-585.

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## Financial Experience of Oregon Unemployment Fund Surveyed

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The two aspects of the Oregon Unemployment Compensation Fund which must be considered are receipts and withdrawals. There are two sources of receipts—employers' contributions and interest earned on the fund. The amount of interest earnings is dependent upon the size of the fund and the rate of interest. The amount of employers' contributions depends upon covered employers' taxable payrolls and the rates of contribution. The size of payrolls, in turn, is determined by the level of employment (and wages). The rates of contribution (under an experience-rating plan)[2] are established by the State Legislature. Hence, economic and legislative factors are operating with respect to contributions.

Withdrawals are represented by the amount of benefits paid to the unemployed workers. Again, economic and legislative factors determine the amount of benefits.

In 1951, Oregon's total labor force comprised approximately 660,000 persons. Agriculture was the largest single industry in number of persons employed (100,000) and lumber and wood products second (83,000). Unemployment in the lumber and wood-products industry has had a much more serious effect upon the fund than unemployment in agriculture, since only a small portion of the latter industry is covered under the Unemployment Compensation Act. Furthermore, the lumber and wood-products industry is dominant in many areas of Oregon, and when poor weather conditions or poor lumber prices cause lumber unemployment, all levels of the economy are adversely affected, which creates secondary unemployment. To make matters worse, parallel seasonal employment patterns exist in the lumber and agricultural industries. High unemployment is experienced during the winter months in both industries.

Legislative changes in the statutory provisions have also had their impact upon the amount of benefits. Modifications in the maximum amount of weekly benefits and in the maximum number of weeks payable are examples. Other illustrations are changes in the eligibility and disqualification provisions of the statute.[3]

Experience trends since the passage of the Oregon Unemployment Compensation Act falls into two periods: the years 1936 through 1945 (prewar and World War II) and 1946 to the present.

The Federal Social Security Act provided that employers were to contribute during the years 1936 and 1937, but that no unemployment compensation benefits were to be paid during these years. The two years were to be devoted to fund accumulation. The employer's contribution rate was 0.9 per cent of the annual payroll in 1936 and 1.8 per cent in 1937. Reserves of $5,824,000 were accumulated for Oregon.

The beginning of benefit payments in January 1938 coincided with high unemployment in the lumber industry. It was indeed fortunate that a fund existed with which to pay benefits. However, employment conditions improved during the summer and fall months. The employer's tax rate was 2.7 per cent and the benefit rate 2.5 per cent. By the end of 1938, the fund's balance was $6,046,000.

More favorable economic conditions existed in 1939, 1940, and 1941. The employer's tax rate remained at 2.7 per cent, and the benefit rate decreased to 1.6 per cent and eventually to 0.7 per cent of taxable wages. The reserve fund had increased to $16,379,000 by the end of 1941.

During the war years, 1942-45, the fund grew rapidly to $74,068,000. Critical labor shortages, not unemployment, was the serious problem during this period, and the average rate of benefits was 0.2 per cent of taxable payrolls.

[2] An experience-rating or merit-rating plan provides for reduced employer tax rates if an employer's experience is favorable. The test used to determine this experience is the percentage of the employer's annual payroll that his contributions exceeds the benefits paid from his account. To illustrate, beginning Jan. 1, 1952, the rates are as follows:

.3%—if contributions exceed benefits by 10% or more of the employer's average annual pay roll.
.6%—if contributions are more than 9% and less than 10% of the employer's average annual pay roll.
.9%—if contributions are more than 8% and less than 9% of the employer's average annual pay roll.
1.2%—if contributions are more than 7% and less than 8% of the employer's average annual pay roll.
1.5%—if contributions are more than 6% and less than 7% of the employer's average annual pay roll.
1.8%—if contributions are more than 5% and less than 6% of the employer's average annual pay roll.
2.1%—if contributions are more than 4% and less than 5% of the employer's average annual pay roll.
2.4%—if contributions are more than 2% and less than 4% of the employer's average annual pay roll.
2.7%—if contributions are less than 2%.

However, if the amount of money in the fund falls below 3 per cent of the average total annual payroll for the preceding five calendar years, no contribution shall be paid at a rate less than 2.7 per cent. See Oregon Laws 1951, pp. 676-677.

In 1939, an Experience Rating Council was created to conduct a study of merit rating for the purpose of determining employers' future rates of contribution to the fund. The council is appointed by the Governor upon recommendations made by the Unemployment Compensation Commission—two representatives of employers, two representatives of employees, two representatives of the public, and the chairman of the Unemployment Compensation Commission. See Oregon Laws 1939, ch. 515, pp. 1082-1083.

[3] Eligibility conditions are conditions that a claimant must meet before he is entitled to receive benefits. The 1935 act, in accordance with the Federal Social Security Act, provided that the claimant must be able to work, willing to work, have accumulated sufficient wage credits, and so forth. The 1947 Legislature added the provision that the claimant must be actively seeking and unable to obtain suitable work. See Oregon Laws 1947, p. 833.

Disqualification conditions are conditions which will disqualify a claimant after he has established his eligibility. Some examples are voluntarily leaving work without good cause, being discharged for misconduct in connection with his work, refusing to accept suitable work, and so forth. The 1947 Legislature made the discharge-for-misconduct disqualification more restrictive towards the claimant by lengthening the disqualifying period from four weeks to a range of four to eight weeks, depending upon the seriousness of the misconduct. Oregon Laws 1947, pp. 834-835.

At the same time, the average rate of contributions was 2.2 per cent of taxable wages. The largest wartime payrolls were concentrated in newly established firms not eligible for reduced tax rates under experience rating; these firms paid at a 2.7 per cent rate.

Thus, the financial experience of the fund during the period 1936-45 was very favorable, receipts exceeding withdrawals by a wide margin. The effects of unemployment upon the fund was practically nil, being troublesome only in early 1938. However, the legislative factor was quite significant.

In 1945 employer's contribution rates were changed from a flat 2.7 per cent of taxable payrolls to a range from 0.5 per cent to 2.7 per cent. The length of the waiting period required of the claimant before drawing benefits was reduced from three weeks to one week. The duration of benefits was increased from fifteen weeks to twenty weeks. The minimum weekly benefit allowance was increased from $7 to $10 and the maximum $15 to $18.[4] Other things being equal, all of these modifications would have resulted in a decrease in the fund's balance. In other words, if these amendments had not been enacted, the fund would have been larger than $74 million.

Benefits exceeded contributions for the first time in 1946. The liquidation of the huge wartime shipbuilding industry resulted in a drain of approximately $5.5 million from the fund. At the end of 1946, the balance was $69,376,000. Employer's tax rates declined to 1.72 per cent while benefits averaged 2.58 per cent of taxable wages.

In 1947, the Legislature increased the weekly benefit amount to $20, and made it easier for employers to attain reduced payroll tax rates.[5] However, because employment and wages rose rapidly in 1947 and 1948, contributions exceeded benefits, and by the end of 1948 the reserve fund was $84,640,000. Benefit rates in 1947 and 1948 were 1.01 per cent and 0.92 per cent, respectively, while the employer's tax rates were 1.80 per cent and 1.69 per cent, respectively.

The 1949 Legislature boosted the minimum and maximum weekly benefits, effective July 1, 1949, to $15 and $25, respectively. It also reduced the employers' tax rates, effective January 1, 1950, to 0.3 per cent, and made it easier for employers to attain the low rates. Throughout 1949, rates of 0.5 per cent, 1 per cent, 1.5 per cent, 2 per cent, and 2.7 per cent were effective. After that, the range was 0.3, 0.6, 0.9, 1.2, 1.5, 1.8, 2.1, 2.4, and 2.7 per cent. Furthermore, employers were permitted to make voluntary contributions to the fund in order to reduce their tax rate by one classification (ie., from 0.9 per cent to 0.6 per cent).[6]

The weather played havoc with the construction and logging and lumber industry in January and February 1949, and unemployment throughout the remainder of the year was higher than during the previous two years. Hence benefit payments in 1949 exceeded contributions by $5,765,000. The average tax rate was 1.7 per cent, while the benefit rate was 2.43 per cent of taxable wages. The fund's balance was $80,935,000 on December 31, 1949.

Business activity was down the first two months of 1950 because of bad weather, but up during the remainder of the year because of liberalized credit for construction purposes and the start of the Korean conflict. Still, benefits exceeded contributions by $8,511,000. The benefit rate was 2.38 per cent of taxable wages, and the average tax rate was 1.39 per cent. By the end of 1950 the reserve fund had decreased to $74,332,000, only slightly more than what existed at the end of 1945.

In 1951, the Legislature reduced the amount of wages (from $2,600 to $1,830) necessary for the claimant to receive $25 a week, and again made it easier for employers to attain reduced tax rates.[7] However, because of the Korean conflict, business activity was high. Contributions represented 1.36 per cent and benefit payments 1.10 per cent of taxable wages. Contributions exceeded benefits by $2,376,000.

A rather severe winter coupled with a slight downward trend in the lumber industry resulted in increased unemployment in 1952. Benefits exceeded contributions by approximately $1.5 million. The reserve fund at the end of 1952 totaled $77,241,000.

The Legislature at its 1953 session did not amend either the benefit or the contribution structure of the act. Benefits reached $14,952,859 for the first ten months of 1953, and are expected to approach $18 million for 1953. The amount in the reserve fund was $73,672,880 at the end of October 1953.[8]

The interest earned on the fund amounted to $11.1 million from 1946 to 1952, and has been large enough to offset entirely the excess of benefits over contributions. Furthermore, much of the unemployment during the postwar period among the veterans of World War II was compensated under the Servicemens' Readjustment Allowance Program. The benefits would have been much more and consequently the fund's balance much less except for this program.

During the period 1936-45 the fund was established and put on a sound footing because of a favorable economic setting. Unemployment was not a problem, except in early 1938, so employer's contributions far exceeded benefits. In this period the Legislature passed certain amendments which resulted in smaller contributions and larger benefits; however, the Legislature should not be criticized, since the experience of the fund was very favorable.

The Legislature's actions during the postwar period, however, are questionable. To illustrate, after the drain of $5.5 million from the fund in 1946, the Legislature at its

[4] See Oregon Laws, Special Session, 1935, ch. 70, pp. 150-169; and Oregon Laws 1945, pp. 345-347, 523-524, 637-639.

[5] The "non-chargeability" provision was passed in 1947. This provision provides that: "An employer's account shall not be charged whenever (1) Benefits are paid without any disqualification to an individual who has left work voluntarily for good cause not attributable to the employer. (2) Benefits are paid for unemployment immediately after the expiration of a period for disqualification, for either (a) having left work voluntarily without good cause, or (b) having been discharged for misconduct, or (c) having failed without good cause either to apply for or to accept suitable work, or to return to customary self-employment." See Oregon Laws 1947, p. 836.

The Legislature evidently intended that the last employer not be penalized when the unemployment is caused by his employee's voluntary acts. However, if this provision were interpreted to mean "*No employer's account shall be charged . . .*," all of the base-period employer's accounts would be exempt. It is clear that such an interpretation could result in reduced tax rates and consequently reduced contributions.

[6] Oregon Laws 1949, pp. 950-951, 959-960.

[7] Oregon Laws 1951, pp. 333, 676-677.

[8] *Statistical Bulletin*, Oregon State Unemployment Compensation Commission, Nov. 1953, p. 1.

1947 session increased the weekly benefit amounts and lowered the tax rate, and did the same thing in the 1949 and 1951 sessions. These "compromises" were very important determinants of the excesses of benefits over contributions in 1949, 1950, and 1952, and the "leveling off" of the fund's balance from 1945 to 1952.

The reserve fund amounted to approximately $77 million at the end of 1952. Is this adequate? Obviously, this is a difficult question to answer. However, there are two criteria which may be used in appraising the fund's adequacy: (1) the size of the fund as a percentage of covered workers' taxable wages and (2) the number of years of benefits that the fund could finance.

In the following table, the fund's balances as percentages of annual taxable wages are presented for the years 1938-1952.

OREGON UNEMPLOYMENT TRUST FUND BALANCE AS A PER CENT OF ANNUAL TAXABLE WAGES, 1938-52[9]

| | *Fund as % of Taxable Pay Roll* | | *Fund as % of Taxable Pay Roll* |
|---|---|---|---|
| 1938 | 2.6 | 1946 | 10.8 |
| 1939 | 3.2 | 1947 | 10.1 |
| 1940 | 4.1 | 1948 | 10.3 |
| 1941 | 4.8 | 1949 | 10.2 |
| 1942 | 4.9 | 1950 | 8.7 |
| 1943 | 6.1 | 1951 | 8.3 |
| 1944 | 8.5 | 1952 | 7.7 |
| 1945 | 11.4 | | |

An examination of this table reveals that the relationship between the fund's balance and wages improved steadily from 1938 to 1945, increasing from 2.6 per cent to 11.4 per cent. But during the postwar period the ratio dropped to 7.7 per cent. On the basis of this criterion, the fund was not as strong in 1952 as in 1945. On the other hand, the ratio of the fund's balance to annual taxable payroll in 1952 was over three times that required by the Federal Social Security Act.[10]

The 1951 reserve was large enough to finance all benefit costs for 4.9 years with no contributions and interest added, provided unemployment followed the pattern of the 1946-51 period. This figure is not too meaningful when considered alone. But, in comparing Oregon with other states, one finds that this state ranked among the lowest one-sixth of the states; only seven states had reserves that would finance for a smaller number of years than Oregon. This is not pleasing to note, especially when one recalls that Oregon's dependence on two major industries results in benefit rates that are considerably higher than the national average.[11] It is not probable that Oregon's relative position was improved in 1952, since the period of time that the fund would last dropped to 4.6 years.

The Oregon State Unemploment Compensation Commission has forecast that an average tax rate of 1.75 per cent of taxable payrolls will be needed to finance the program 1951 until 1960.[12] The average tax yield under the experience-rating provision was 1.36 per cent in 1951 and about 1.15 per cent in 1952. Thus, should unfavorable economic conditions prevail during a part of the decade as forecast, contributions will not be sufficient to finance benefits, and part of the reserve fund will be needed to defray them. All of this is predicated on the assumption that the Legislature does not increase benefits.

The present method used to finance unemployment compensation in Oregon is subject to biennial changes in the law. The development of the program has been influenced by employer and union pressure. From 1945 through 1951, each session of the Legislature resulted in increased benefits and decreased tax rates. The writer concurs in the declaration of the commission: "Ultimately a point is reached where this sort of compromise becomes impossible if the solvency of the program is to be maintained."[13]

The present method of financing should be abandoned.[14] The Legislature should strive toward the objective of financing the unemployment compensation program on a sound footing over a period of years. Pressures as a basis for amendments should be supplanted by facts concerning the future outlook of the program. The *Digest* and similar studies serve to provide this required factual basis.

[9] *Digest of the Financial Experience and Actuarial Requirements of the Oregon Unemployment Compensation Program*, Oregon State Unemployment Compensation Commission, p. 20, Table 3.

[10] An amendment to the Federal Social Security Act, effective Jan. 1, 1942, provided that: "No reduced rate of contributions to a reserve account is permitted to a person ... having individuals in his ... employ unless (A) ... (B) ... (C) the balance of such account amounts to not less than 2½ per centum of that part of the payroll ..." *See Internal Revenue Code*, June 1952, Sec. 1602, p. 2532-A. In effect, a minimum ratio of the fund's balance to the annual payroll has been established at 2.5 per cent by the U. S. Congress

[11] Oregon's benefit rate was 1.1 per cent in 1951, while the national average was 0.9 per cent. *Digest*, p. 7.

[12] *Op cit.*, p. 1.

[13] *Op. cit.*, p. 12.

[14] Perhaps it has been, since the 1953 Legislature did not compromise.

## New Horizons Seen for Pacific Northwest Industry

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(with a 22 per cent per capita increase in lumber consumption from 1940 to 1950), trends in per capita consumption of competitive materials have gone up much more markedly: steel increased 37 per cent, aluminum products, 206 per cent, and plastics 2,414 per cent. The association concluded that one way of solving the forest-products industry's competitive problem is through product and process improvement and development through research. The days when "a strong back and a sharp axe" were the only requisite tools for fame and fortune are over—technology must be brought into an inseparable partnership. The conjunctive use of chemistry, electronics, plastics, and light metals may aid the industry in achieving greater stability.

In agriculture, the opportunities for additional employment are not inexhaustible. The direct pressures of population growth nationally and regionally, together with rising standards of living, cannot fail to bear favorably upon the Pacific Northwest's highest-quality, diversified agricultural production. However, the requirements of the food-products industry for higher quality and specialized farm production must become clearly recognized if the region's agricultural position is to be maintained and expanded. Here, as in the forest-products industry, the needs for technological improvements are paramount in crop and animal production techniques (fertilizers, insecticides, soil conditioners, genetics, nucleonics), in preparation (chemicals, electronics), and in merchandising (chemicals, plastics, and light-metals utilization.)

Electroprocess industries, a new segment of Northwest industry, has seemed destined to provide a major portion of new jobs in the area; but the outlook for some years ahead is dimmed by a deplorable stalemate. Electroprocess industries—such as aluminum and chemical production—underwent extraordinary growth in the region during the past fifteen years. Starting virtually from scratch, these industries now provide well over 5 per cent of total manufacturing payrolls in the region. The recent addition of primary fabricating facilities at some of the major aluminum plants is adding substantial new employment opportunities and creating a market for new labor skills. However, one must realistically face the fact that the prospects for growth in this industry are now essentially nil until very substantial new sources of power are brought into production. Not only are such new supplies of electric power desperately required, but the level of the sales price of this power must be kept low if the region's electroprocess industries are to survive and maintain a competitive position.

The Pacific Northwest should be ripe for a determined shift in emphasis, for a supplementing of traditional activities in the exploitation of raw-material resources by more intensive manufacturing and the application of new technologies. First, there is the driving urgency to keep in the jet stream of national progress in industry. Second, Pacific Northwest markets have reached a respectable size, and their areal scope has indirectly increased because of rising freight rates which make it more costly for out-of-region manufacturers to compete with local enterprise. This latter fact is evidenced by the increasing trend toward the establishment of Pacific Northwest branch plants and distributing warehousing by national industry. Third, new skills are available to the region, if by no other process than through the accretion of such skills in population migrations from other more industrially advanced areas of the nation.

The field of new possibilities is truly immense. Product manufacturing—as contrasted with semi- and raw materials production—offers an infinite variety of outlets for ingenuity, for the development of techniques, and for the exercise of good business and merchandising practices. In a very large sense, the opportunities for small business—small capital investments, relatively small but flexible payrolls—are compounding rather than fixed and limited. Of extreme importance is the fact that product manufacturing offers a wide opportunity for youth and energy, and for the utilization of skilled workers and technicians. Young people have long been an exportable commodity from the Pacific Northwest—it is time we obtained better utilization of this resource in our midst.

In viewing the nature of industrial expansion in the United States, one cannot fail to be impressed by the emphasis on new manufacturing materials and new manufacturing technologies. Light metals, once parsimoniously utilized, are now competing directly with traditional metals and other materials in a wide range of applications. Plastics are ubiquitous in all phases of modern-day existence. The use of electronics—from computers to quality-control mechanisms—is achieving a monumental revolution in all phases of industry. The horizons of nucleonics—involving all phases in the application of nuclear physics—are barely discernible, but bear considerable promise in relation to industrial processing and agricultural production. The range of new chemicals is simply staggering.

The field of electronics, having received its greatest impetus during and since the last war, is continuing its rapid advances. The industry, including radio and television broadcasting as well as the growing phonograph business, was rated nationally in 1952 at $8 billion and employed over one million people directly and indirectly. In the manufacturing end of the industry employment reached 280,000 in 1951, and output in 1950 was estimated at $2.5 billion, plus $500 million in parts and tubes. The industry has been largely concentrated in the Chicago, New York, Philadelphia-Camden areas. However, the industry is growing very rapidly on the Pacific Coast. In a very few years, it will reach the billion dollar mark, according to the president of the West Coast Electronics Manufacturers Association. In 1953 the electronics industry in the coast states employed more than 60,000 and had an output of over $600 million.[2]

Each day marks the development of new fields of use for electronic devices. The Stanford Research Institute has described the major categories as follows: (1) radio and television broadcasting, including television use in industry; (2) radio and wire communications, including telephone, fascimile, teletype, etc.; (3) information-handling machines, including mathematics computers and simulators; (4) electronic power conversion, including rectification, inversion, frequency conversion, dialectric and induction heating; (5) electrical controls, including servo-mechanisms, all closed-circuit sensing and controlling systems; (6) electrical instrumentation, including hearing aids and other medical instruments and navigational aids, as well as instruments for generation and measuring of physical quantities; (7) military electronics, including fire control, guided missiles, torpedoes, proximity fuses, and other ammunitions electronics.

The roster of such equipment is truly fabulous. The development of electronic industries in the Pacific Northwest, even if related initially to the region's existing industrial activities, is a fertile field. Electronic appliances could be developed for use in the woods, in the sawmill, and throughout the finishing units of the forest-products industry. Radio-frequency equipment is already utilized for the thermosetting of glue lines in the plywood industry. Some work is being done on similar applications in the manufacture of hardboard. Quality- and size-control applications are numerous. Moisture-content analysis for kiln drying offers additional possibilities. Surface hardening of saw teeth is now being done electronically.

In agriculture, there are also distinct possibilities. One recent example is the electronic device for cracking walnuts, which is in operation by one of Oregon's foremost nut-growing associations. Automatic control of lighting in large chicken houses is an accomplished fact. The use of electronic equipment for candling eggs is another example of recent origin. The list of farm opportunities for electronics is a large one.

The structure of the electronics industry, viewed nationally, is somewhat distorted by the very large number

[2] Portland *Oregonian*, Nov. 8, 1953, "Business Briefs," reporting statement of Norman H. Moore, president of West Coast Electronics Manufacturers Association.

of plants which are engaged in radio- and television-set manufacture. The existence of these large mass-production units obscures the fact that numerous small concerns are engaged in many phases of electronics activities. According to the U. S. Department of Labor,[3] even at the peak of the defense period, there was less mass production of standard electronic equipment than in World War II. This is apparently due to the fact that constant technological changes make such mass production impractical. For radio and television manufacturing, however, there are definite indications that the printed circuit and the production of standard wired components may increase the utilization of mass-production technique. On the other hand, for a very large segment of the electronics industry, research and development expenses will continue to account for a large proportion of the total value of the output of the industry, so that a flexible type of operation can benefit, given good research facilities and staffs.

A small concern (in terms of the national concept of "smallness") has a definite place in the field. The initial capital investment is relatively small (except for component-parts manufacture such as vacuum tubes), and the equipment is usually quite flexible. The electronics industry's work force is composed of semiskilled and unskilled workers—women account for about one-half of this employment. However, the requirements for supervisory and research staffs place heavy reliance on highly trained engineers. The success of an electronics enterprise, assuming good management and good merchandising, is largely dependent on what has been termed "organized creative technology." The ability of the research and engineering staff and the consistency of its efforts will determine the success of the enterprise. No field offers greater latitude for imaginative engineering and research.

The use of plastic materials has skyrocketed nationally, and all indications are that the rapid rise of the industry will continue. In 1925, the industry produced some 28 million pounds of plastic substances; by 1950 the output has multiplied 34 times. Recent estimates place its 1975 potential at over 8 billion pounds—more than eight times present output.[4]

The rise of the plastics industry has depended on extraordinary advances in chemical research, which has resulted in creation of a large variety of plastic substances and their intermediates. These various kinds of plastics possess many specialized properties of strength, toughness, water and corrosion resistance, color, finish, and ease of fabrication. The basic materials are available to the manufacturer in liquid, solid, or powdered form, depending upon the specific manufacturing intent. They are also available in semi-finished form: tubes, rods, sheet, film, and blocks which can be machined, fabricated, and assembled as desired. Fibers, fabrics, and cloths are also available. Competition among the basic producers of plastic materials and their intermediates is very keen. Hardly a month passes without some announcement of a new and specialized plastic substance. Thus, the manufacturer of plastic articles has a wide variety from which to choose, with specific properties for the job at hand.

[3] "Expansion in Electronics Employment," *Monthly Labor Review*, Feb. 1952.

[4] Raymond H. Ewell, "Past and Future Growth of the Chemical Industry," *Chemical and Engineering News*, Dec. 10, 1951.

The plastic materials include the phenolics, ureas and melamines, vinyls, polystyrenes, cellulosics, polyethylenes, acrylics, coumarones, and many others. They may be molded, pressed, extruded, rolled, formed, and poured, and can be used as surface coatings or to impregnate another material. Their flexibility in terms of end use is enormous. To attempt to list all common and specialized usages would be to cover almost every phase of modern activity. The following is merely a random recitation of a few scattered uses: plastic pipe, garden hose, tanks for chemicals, nylon gears, protective linings, laminates, industrial pipe and fittings, toys, trays, racks and boxes, automotive parts, squeezable bottles, furniture and architectural parts, apparel and accessories, signs and displays, phonograph records, packaging and containers, electrical parts and insulation, dish ware, household wares, paper treatment, venetian blinds.

Good engineering—in design and in operation—is a prerequisite to successful plastics manufacture. Obviously, the ability of a plastics manufacturer to compete and expand rests also upon good management, aggressive salesmanship, and ability to seek outlets for new uses of finished plastic materials. Investments in machinery and equipment vary greatly, depending mainly upon the volume of manufacturing to be undertaken. However, a small flexible plant can be set up with a moderate amount in capital and operating investment. Skills required vary with the type of production, but there are no operations which are so complex that normal intelligence will not make possible the development of requisite skills in short order.

The Pacific Northwest is not only a consumer of plastic products but also employs plastic materials in many forms and ways. Perhaps the most significant application has been in the use of synthetic resins in the plywood and hardboard industry. There are a few plants producing plastic articles (garden hose, house ware, and the like) and some production is reported on the use of fibrous-glass plastic laminates. Statistical information on the use and manufacture of plastics in the Pacific Northwest is scarce, so that —for the purposes of this discussion—no index of present production can be given with reliability. However, it seems safe to say that the industry has barely made a start in the region, and that the opportunities for considerable expansion are good.

For illustrative purposes only, attention may be called to certain specialized fields which may offer substantial opportunity for local manufacturing. For example, the availability of both fibre-glass and plastics has resulted in the production elsewhere of various types of laminated products possessing such attributes as resistance to moisture and corrosion, light weight combined with strength, and unusual workability. These laminates may be produced in translucent form and with varied color. Their use for greenhouses, patio covering, and office partitions has already been established in the region, although not yet in volume. Packaging possibilities of these laminates have not yet been explored, nor have a good many other applications. Of similar interest are plastic pipe and fittings. For example, an oil pipe line is being built in the Williston Basin in the Dakotas, using extruded plastic piping. Why not use this type of pipe in irrigation? A "build it yourself" lawn sprinkling system, made of plastic pipe and fittings, is now being offered in cities of the Northwest. The impregnation

of wood products with plastic materials also offers unique possibilities for the production of high-quality furniture and fixtures.

The light-metals industry has expanded greatly, especially during the past fifteen years. The national production of aluminum has grown to ten times its 1940 level. By 1955, when presently planned expansion in basic production is completed, the basic industry will employ more than 200,000 people in its plants, offices, and laboratories. The 4,000-odd uses in fabricated and manufactured products involve upward of 14,000 firms—large and small—with an over-all employment in the United States estimated at well over a million people. Magnesium production has also assumed an important part in the metals industry. Titanium—the newest of light metals—is now in tonnage production and will soon be commercially available in a substantial scale.

The outlook of aluminum and light metals is for steady growth. Not only do defense requirements lean heavily upon aluminum, magnesium, and titanium supplies, but the civilian economy will absorb a major proportion of metal output. The President's Material Policy Commission estimated an increase of five times 1950 aluminum demands for 1975, seven times for magnesium, and as much as one hundred times for titanium. These estimates, of course, imply that manufacturing capacities for end products will keep pace with basic production.

Although there has been much talk of developing a "light metals empire" in the Pacific Northwest—which has over one-third of the nation's primary production capacity—the structure of the industry is still somewhat rudimentary, especially in terms of fabrications and manufactures. Recent surveys indicate that somewhere around 500 firms in the region manufacture aluminum articles or use aluminum in their operations. Most of these firms seem to have grown up in the state of Washington, reflecting no doubt an accretion of skills and close interests springing from the Boeing aircraft operations.

Light-metals fabrication is adaptable for very small manufacturing establishments. Equipment is not necessarily expensive. The techniques are well covered by numerous bulletins issued by all the aluminum companies, and their sales staffs are assiduous in assisting manufacturers of aluminum products in doing a good job. The skills required are probably not in great supply in the Pacific Northwest, but they are not beyond developing. The possibilities of estab-

# PORTLAND FOOD PRICES—DECEMBER 1953

The University of Oregon Bureau of Business Research, working with data collected by the United States Bureau of Labor Statistics, reports that, of 71 foods priced in Portland in mid-December, 24 were higher than in mid-November, 25 were lower, and 22 were unchanged. Meats, except beef, were up; canned fruits and vegetables were down; and fresh fruits and vegetables reflected seasonal trends.

| Commodity and Unit | In Cents: Average Dec. 15 1953 | Change from Last Month | Dec. Range of Prices: High | Low |
|---|---|---|---|---|
| **CEREALS & BAKERY PRODUCTS:** | | | | |
| Cereals: | | | | |
| Flour, wheat (5 lbs.) | 54.8 | .3 | 62 | 51 |
| Corn flakes (12 oz.) | 22.4 | .1 | 24 | 22 |
| Corn meal (lb.) | 12.6 | .... | 14 | 11 |
| Rice (lb.) | 24.2 | — .1 | 29 | 23 |
| Rolled oats (20 oz.) | 20.3 | — .1 | 22 | 20 |
| Biscuit mix (20 oz.) | 26.9 | .... | 30 | 24 |
| Bakery products: | | | | |
| Bread, white, per loaf (lb.) | 18.1 | .... | 18 | 17 |
| Vanilla cookies (7 oz.) | 24.9 | .1 | 26 | 22 |
| Soda crackers (lb.) | 28.2 | .... | 29 | 28 |
| **MEATS, POULTRY & FISH:** | | | | |
| Meats: | | | | |
| Beef: | | | | |
| Round steak (lb.) | 92.0 | — .6 | 99 | 85 |
| Rib roast (lb.) | 77.9 | — .7 | 85 | 65 |
| Chuck roast (lb.) | 55.6 | — .9 | 59 | 45 |
| Frankfurters (lb.) | 52.9 | 1.0 | 59 | 45 |
| Hamburger (lb.) | 40.1 | — .4 | 59 | 35 |
| Veal: | | | | |
| Cutlets (lb.) | 94.6 | 1.7 | 132 | 85 |
| Pork: | | | | |
| Chops (lb.) | 84.5 | 4.5 | 89 | 69 |
| Bacon, sliced (lb.) | 79.3 | 1.5 | 89 | 75 |
| Ham, whole (lb.) | 70.6 | 4.5 | 75 | 65 |
| Lunch meat, canned (12 oz.) | 50.8 | .2 | 57 | 45 |
| Lamb: | | | | |
| Leg (lb.) | 71.2 | .6 | 79 | 69 |
| Poultry: | | | | |
| Fryers, N.Y. dr. (lb.) | 51.5 | .1 | 59 | 39 |
| Fish: | | | | |
| Salmon, canned (lb.) | 51.0 | 1.3 | 59 | 45 |
| Salmon, fresh (lb.) | 71.3 | .... | 79 | 69 |
| Halibut, fresh (lb.) | 64.0 | .... | 69 | 55 |
| Tuna, canned (7 oz.) | 39.4 | .... | 43 | 39 |
| **DAIRY PRODUCTS:** | | | | |
| Butter (lb.) | 77.6 | .... | 82 | 75 |
| Cheese, Amer. proc. (lb.) | 58.3 | .6 | 60 | 58 |
| Milk: | | | | |
| Fresh, delivered (qt.) | 22.0 | .... | 22 | 22 |
| Fresh, grocery (qt.) | 21.6 | .... | 22 | 22 |
| Evaporated (14½ oz. can) | 14.3 | .... | 16 | 14 |
| Ice cream (pt.) | 28.3 | .... | 33 | 25 |
| **EGGS, Fresh (doz.)** | 69.2 | .... | 73 | 67 |
| **FRUITS AND VEGETABLES:** | | | | |
| Frozen: | | | | |
| Strawberries, sl. (12 oz.) | 34.2 | — 1.0 | 39 | 28 |
| Orange juice, conc. (6 oz.) | 19.8 | — 1.5 | 25 | 17 |
| Peas (12 oz.) | 22.9 | .... | 30 | 21 |

| Commodity and Unit | In Cents: Average Dec. 15 1953 | Change from Last Month | Dec. Range of Prices: High | Low |
|---|---|---|---|---|
| **FRUITS & VEGETABLES (cont.):** | | | | |
| Green beans (10 oz.) | 22.6 | .... | 25 | 21 |
| Fresh: | | | | |
| Apples (lb.) | 12.5 | — .9 | 16 | 8 |
| Bananas (lb.) | 19.4 | — .2 | 22 | 17 |
| Oranges (size 200, doz.) | 53.7 | — 1.3 | 78 | 39 |
| Beans, green (lb.) | * | | | |
| Cabbage (lb.) | 6.1 | .... | 10 | 5 |
| Carrots (bunch) | 10.4 | 1.3 | 15 | 8 |
| Lettuce (head) | 14.2 | .4 | 19 | 11 |
| Onions, yellow (lb.) | 5.3 | — .3 | 13 | 4 |
| Potatoes, white (15 lb.) | 68.5 | .4 | 94 | 50 |
| Sweet potatoes (lb.) | 13.5 | — .9 | 19 | 10 |
| Tomatoes (lb.) | 30.0 | 11.2 | 47 | 23 |
| Celery (lb.) | 12.5 | 1.6 | 20 | 10 |
| Lemons (lb.) | 18.9 | .... | 28 | 15 |
| Canned: | | | | |
| Peaches (no. 2½ can) | 29.8 | — .7 | 33 | 27 |
| Pineapple (no. 2½ can) | 36.2 | .... | 39 | 34 |
| Orange juice (46 oz.) | 41.1 | .4 | 49 | 36 |
| Fruit cocktail (no. 2½ can) | 39.7 | .... | 48 | 38 |
| Beans with pork (16 oz.) | 14.1 | .... | 15 | 14 |
| Corn, cream style (no. 303 can) | 19.3 | — .1 | 22 | 17 |
| Tomatoes (no. 2½ can) | 23.6 | — .1 | 29 | 22 |
| Peas (no. 303 can) | 20.0 | .... | 24 | 17 |
| Vegetable soup (11 oz.) | 14.6 | — .1 | 16 | 12 |
| Baby foods (4½-4 ¾ oz.) | 9.0 | — .1 | 10 | 9 |
| Dried: | | | | |
| Prunes (lb.) | 28.3 | .4 | 32 | 26 |
| Navy beans (lb.) | 19.9 | .6 | 23 | 16 |
| **BEVERAGES:** | | | | |
| Coffee (lb.) | 90.3 | — .2 | 99 | 82 |
| Tea (¼ lb. pkg.) | 35.6 | — .3 | 41 | 35 |
| Cola drink (6 bottles) | 34.6 | — .3 | 42 | 33 |
| **FATS AND OILS:** | | | | |
| Lard (lb.) | 29.0 | — .1 | 35 | 22 |
| Shortening, hydrog. (lb.) | 34.5 | .2 | 39 | 32 |
| Salad dressing (pt.) | 36.1 | — .8 | 41 | 32 |
| Margarine, colored (lb.) | 31.0 | .1 | 35 | 28 |
| Peanut butter (lb.) | 52.5 | — .5 | 56 | 49 |
| **SUGAR AND SWEETS:** | | | | |
| Sugar (5 lb.) | 56.5 | — .9 | 62 | 55 |
| Corn syrup (24 oz.) | 24.8 | .... | 27 | 24 |
| Grape jelly (12 oz. jar) | 26.9 | .3 | 34 | 23 |
| Chocolate bar (1 oz.) | 4.4 | .... | 5 | 4 |
| **MISCELLANEOUS:** | | | | |
| Gherkins, (7½ oz.) | 31.3 | .... | 39 | 22 |
| Catsup (14 oz.) | 23.8 | .... | 32 | 17 |
| Gelatin dessert | 9.0 | .... | 10 | 8 |

* Insufficient number of quotations to obtain a reliable average price.

lishing and expanding training programs for the handling of light metals should be seriously regarded by the region's technical high schools, trade schools, and other institutions of learning. There is no question but that the aluminum industry would cooperate fully in the development of such programs.

The Pacific Northwest already occupies an important position in the field of nucleonics through the Hanford Works in Washington, the Arco establishment in Idaho, and the zirconium plant of the U.S. Bureau of Mines at Albany, Oregon. There are, however, many aspects of the field which will ultimately provide a basis for diversified manufacturing in the region. Broadly speaking, these opportunities can be classified as follows: (1) production of essential materials used in atomic-energy material production and utilization—these include zirconium and the refinement of rare earths and radioactive raw materials; (2) production of equipment which will be required for atomic-power reactors, including instrumentation; (3) utilization of radioactive isotopes in manufacturing processes and methods, as well as for research in agriculture, forestry, and manufacturing.

It is too early to attempt a pinpointing of fields of opportunity. However, Pacific Northwest industry would do well to maintain close liaison with private and public agencies engaged in atomic research. Some of the colleges of the Northwest are engaged in some phases of the atomic-energy research program, and their staffs are cognizant of the areas of potential development. Inasmuch as "the atom is here to stay" and there is fever-heat interest by industry elsewhere in possibilities of nuclear physics, the Pacific Northwest should lose no time getting into the stream.

Considerable attention has been given to the development of chemical industries in the Pacific Northwest. A strong structure has already been established, with the output directed primarily toward uses in forest and agriculture. For example, the chlorine and caustic-soda industry of the Pacific Northwest is closely allied with the development of the region's pulp and paper industry. The growing production of insecticides and weedicides reflects local demands of agriculture. But there are still many phases of the over-all chemical industries which can be developed in our area.

Recent estimates show that medicinal chemicals (such as antibiotics and pharmaceuticals) will probably increase present sales volume seven times by 1975, fertilizers five times, surface active agents over six times, synthetic insecticides more than three times, pigments more than two times. There are others, but the foregoing have particular interest to the Pacific Northwest.

Investment in chemical plant is substantial, and it takes first-class continuing engineering and research programs to maintain a competitive standing in a fast-moving industry. However, many units of the industries are based upon the controlled compounding of chemicals obtained from large suppliers. There is here a field for smaller units of production. Expansion of the chemical industry in the Pacific Northwest is reasonably assured. One element of significant importance is our abundance of high-quality water for processing. The lack of good water is causing much concern to the chemical industry elsewhere in the United States.

In viewing the perspective of future developments, it is important to reiterate a few fundamentals. To assure success in these new duties—all highly technological—research, development, quality engineering, and control are imperative. Good alert management is essential. Merchandising ability is a "must."

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On a year-around basis, farmers and their families do more than three-fourths of all farm work in the United States, while hired help does less than a fourth.

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Individuals and businesses had $216 billion of readily spendable savings after World War II, compared to $22 billion after World War I.

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Annual surplus of births over deaths per thousand of population rose in the United States from a low of 5 in 1936 to nearly 16 in 1947, highest in history.

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